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LOGISTIC PLAN
REVIEW CRITERIA
FOR THE
OPERATIONAL LEVEL OF WAR

by

Kevin R. Wheelock
LCDR SC USN

A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements for the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

Signature: _____

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Paper directed by Captain D. Watson, USN
Chairman, Joint Military Operations Department

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Faculty Advisor Date

CAPT J. E. Jackson, SC, USN
Faculty, National Security Decision Making Department
Frederick J. Horne Military Chair
of Logistics and Sustainability

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15.Abstract:

JOINT DOCTRINE DOES NOT PROVIDE THE COMBATANT COMMANDER WITH A SET OF REVIEW CRITERIA FOR THE LOGISTIC PLAN. IF THE LOGISTIC PLAN DOES NOT SUPPORT THE OPERATION PLAN, THE OPERATION MAY NOT SUCCEED.

THIS PAPER DEVELOPS THE LOGISTIC PLAN REVIEW CRITERIA, A BANK OF FIVE QUESTIONS ROOTED IN THE PRINCIPLES OF LOGISTICS. THE LOGISTIC PLAN REVIEW CRITERIA ESTABLISH AN AGENDA FOR THE COMBATANT COMMANDER AND HIS LOGISTICIAN TO EVALUATE THE LOGISTIC PLAN. THE COMBATANT COMMANDER WILL HAVE MORE CONFIDENCE WITH A MILITARY OPERATION IF HE CAN EVALUATE THE LOGISTIC PLAN AGAINST ITS OWN SET OF REVIEW CRITERIA SEPARATE FROM THE OPERATION PLAN REVIEW CRITERIA.

THE LOGISTIC PLAN REVIEW CRITERIA HAVE FOUR UNIQUE CHARACTERISTICS. THEY A) DEFINE THE LIMITS OF THE LOGISTIC SYSTEM, B) ALLOW INFORMATION TO BE MANAGED BY EXCEPTION, C) FILL THE VOID BETWEEN THE PRINCIPLES OF LOGISTICS AND THE LOGISTIC CHECKLISTS, AND D) HAVE UNIVERSAL APPLICATION TO ALL OF THE MILITARY SERVICES.

THE FIVE LOGISTIC PLAN REVIEW CRITERIA ADDRESS A) RESPONSIVENESS, B) SUSTAINABILITY, C) LOGISTIC CULMINATING POINTS, D) RISKS, AND E) ABILITY TO REACT TO AN UNPLANNED CONTINGENCY.

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Abstract of

LOGISTIC PLAN REVIEW CRITERIA
FOR THE OPERATIONAL LEVEL OF WAR

Joint Doctrine does not provide the combatant commander with a set of review criteria for the logistic plan. If the logistic plan does not support the operation plan, the operation may not succeed.

This paper develops the Logistic Plan Review Criteria, a bank of five questions rooted in the Principles of Logistics. The Logistic Plan Review Criteria establish an agenda for the combatant commander and his logistician to evaluate the logistic plan. The combatant commander will have more confidence with a military operation if he can evaluate the logistic plan against its own set of review criteria separate from the Operation Plan Review Criteria.

The Logistic Plan Review Criteria have four unique characteristics. They a) define the limits of the logistic system, b) allow information to be managed by exception, c) fill the void between the Principles of Logistics and the logistic checklists, and d) have universal application to all of the military services.

The five Logistic Plan Review Criteria address a) responsiveness, b) sustainability, c) logistic culminating points, d) risks and e) ability to react to an unplanned contingency.

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"A sound logistic plan is the foundation upon which a war operation should be based. If the necessary minimum of logistic support cannot be given to the combatant forces involved, the operation may fail, or at best be only partially successful."

--Admiral Raymond A. Spruance, USN
Commander Fifth Fleet, 1946[1]

INTRODUCTION

Admiral Spruance correctly identifies the critical link between the operation plan and the logistic plan. All else becomes irrelevant if logistics cannot support the operations of the combatant commander.[2]

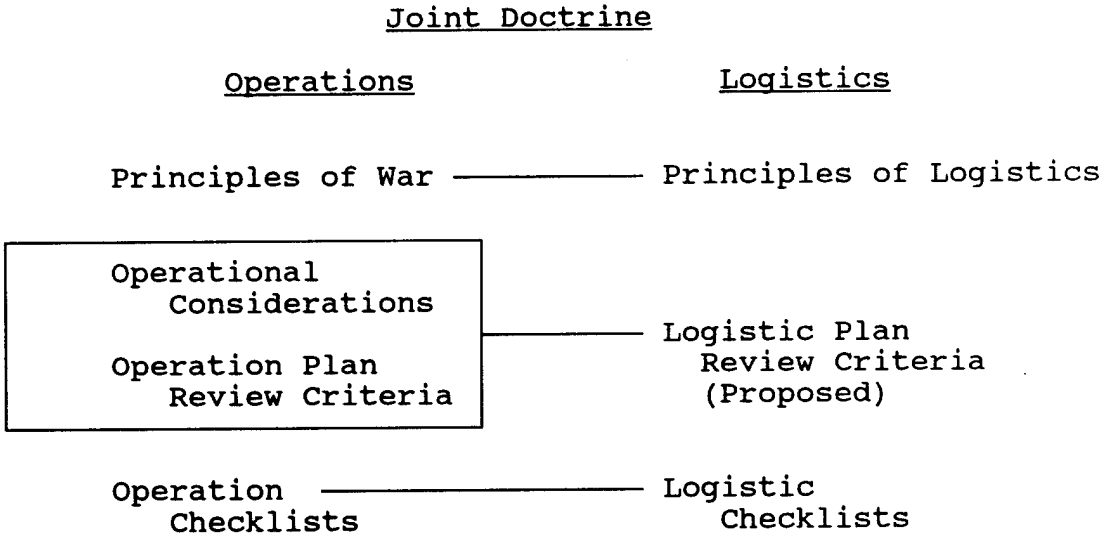
What tools are available to the combatant commander to evaluate the logistic plan? The library of joint publications provides both the Principles of Logistics and the more mundane logistic checklists. The Principles of Logistics provide the broad guidance to build the logistic plan. The checklists identify those lesser, but not insignificant, logistic issues that demand attention.

Between the Principles of Logistics and the checklists one would expect at the operational level of war a set of review criteria for the logistic plan, a short list of probing questions to determine how well logistics will support a military operation. Nonetheless, no such bank of questions exists. This paper proposes five questions (called the "Logistic Plan Review Criteria") that the combatant commander should use to evaluate the logistic plan at the operational level of war.

THE NEED FOR LOGISTIC PLAN REVIEW CRITERIA

Why should the combatant commander[3] need a set of Logistic Plan Review Criteria? An analogy best answers this question. Joint Doctrine provides the combatant commander with a hierarchy of considerations for the operation plan, starting with the Principles of War and ending with the operation checklists. Joint Doctrine also provides a middle ground consisting of two sets of review criteria, called Operational Considerations and Operation Plan Review Criteria. The Operational Considerations

Diagram #1



address the ends, ways, means and risks of a military operation.[4] For instance, the combatant commander should determine if the military conditions (the ends) produced in the operational theater will achieve the strategic goal. Three other questions address ways, means and risks. With the Operation Plan Review Criteria the combatant commander evaluates the plan for adequacy,

feasibility, acceptability, and compliance with joint doctrine.[5] The combatant commander should reject a proposed operation plan that does not fulfill both sets of criteria.

While two sets of review criteria exist for the operation plan, Joint Doctrine does not have a similar set of criteria for the logistic plan (see Diagram #1).[6] However, Joint Doctrine needs these criteria. The combatant commander will have more confidence with a military operation if he can evaluate the logistic plan against a separate set of criteria rooted in the Principles of Logistics (see Appendix A).

The characteristics of the Logistic Plan Review Criteria and their underlying assumptions will be described first. With a proper understanding of these characteristics and assumptions the combatant commander will determine what information he should glean from the Logistic Plan Review Criteria and the implications for the operation plan. After describing these unique characteristics, the five Logistic Plan Review Criteria will be identified and examined.

CHARACTERISTICS OF THE LOGISTIC PLAN REVIEW CRITERIA

The Logistic Plan Review Criteria have four distinct characteristics. First, these criteria define the limits of the logistic system and available resources. By defining the outer envelope of the logistic system, these criteria defuse the inherent tension between the planner and the logistician at the operational level of war. The planner must be encouraged to work

with an unrestricted vision to develop an operation plan that will achieve the strategic objectives dictated by the National Command Authorities (NCA). The consummate operation plan will place tremendous demands on the logistic system. The inherent tension arises when the logistician compares the operation plan against the capabilities of the logistic system and determines that part of the operation plan may not be supported logistically. At this point in the planning process the planner and the logistician will have developed the operations-logistic gap.[7] If he wishes to succeed, the combatant commander must bridge this gap and face two choices to integrate operational and logistic capabilities. He can lobby for more logistic resources, or, if additional resources are not available, pare down his operation plan to bridge the operations-logistic gap. A resolution is imperative. The operation plan can not break the logistic system without sacrificing the operation itself.[8]

Why is logistics a limiting factor? The term "logistics" has been defined as "military economics"[9] where, by the nature of economics, all resources are limited in supply. This inherent fact of limited resources led one logistician to remark:

> [At the strategic level e]conomic forces limit our ability to create combat forces; operational logistic factors limit our ability to employ our combat forces.[10]

Therefore, the combatant commander should use the Logistic Plan Review Criteria to define the limits of the logistic system, expect that the logistician will discover shortfalls when resourcing a plan, and bridge the operations-logistic gap.

Second, the Logistic Plan Review Criteria allow information to be managed by exception. The criteria ask for the best possible circumstances (for instance, that the logistic system can sustain all combat forces). However, knowing that the logistician is resource-constrained and that these criteria seek to identify the limits of available resources, the combatant commander should not expect the logistician to respond "yes" to each of these questions. Instead, the logistician will provide the combatant commander with those exceptions that do not meet the best possible case asked by the criteria. The candid answers provided by the logistician reduce the information for the combatant commander to those exceptional circumstances that demand his attention.

Third, these criteria fill the void previously identified between the Principles of Logistics and the logistic checklists.[11] Finally, these criteria have universal application. Their interpretation depends on the particular circumstances surrounding the operation and the service perspective of both the combatant commander and his subordinate logistician.

THE FIVE LOGISTIC PLAN REVIEW CRITERIA

Criterion #1. Is the logistic plan responsive to the needs of the military forces?

> "It is no great matter to change tactical plan in a hurry and to send troops off in new directions. But adjusting supply plans to the altered tactical scheme is far more difficult."
>
> - General Walter Bedell Smith, USA, 1956[12]

"Responsiveness" is the right support at the right place at the right time.[13] Despite its inherent limitations, a logistic system that responds to the needs of the combat forces will allow them to reach their full fighting potential.

In order to be responsive, the logistician must anticipate a wide range of requirements. The combatant commander may require logistic mobility to support an advancing force, flexibility to sustain an expanding force, or simply heroics to reconstitute an exhausted force. To answer this criterion, the logistician may apply additional concepts from operational art, including a) the arrangement of operations, b) logistic discipline, and c) synchronization.

Arrangement of Operations: A responsive logistic system must accommodate the demands generated by the arrangement of operations. How well the logistic system responds to the arrangement of operations will determine the success of phasing, its branches and sequels, and ultimately the timing, tempo and momentum of the operation.

Since the outcome of any phase is uncertain, each phase has its own branches and/or sequels. To be responsive, the logistician must marshal the logistic support accordingly for each phase and every possible branch and sequel. Anticipating these prospects, the logistician may determine that the logistic system can not accommodate the unique demands for a particular branch or sequel. Time and distance factors or availability of critical items may limit the support for that branch or sequel.

The calculus of logistic support is complicated due to the uncertainty of when one phase transitions to the next and how quickly the logistic system can respond. Phases may be sequential or concurrent. If in the fog of war sequential phases become concurrent phases, logistic demands will multiply across the full spectrum of support. The logistician may conclude that logistic support is impossible if planned sequential operations (that were logistically supportable) unintentionally transition into concurrent operations.

Logistic Discipline and the Logistic Snowball.

"Responsiveness" is a hostage to logistic discipline. Since intra-theater transportation, supplies, and logistic personnel will always be limited, logistic discipline is required to ensure that these resources are distributed in a manner that best meets the requirements of the combat forces and the arrangement of operations. Logistic discipline promotes economy, efficiency and effectiveness. The absence of logistic discipline, however,

leads to a less-than-optimal allocation of resources,[14] ultimately creating the Logistic Snowball:

> [A]ll logistic activities naturally tend to grow to inordinate size, and unless positive control is maintained, this growth continues until, like a ball of wet snow, a huge accumulation of slush obscures the hard core of essential combat support and the mass becomes unmanageable....The logistic snowball is particularly dangerous and expensive in overseas operations, especially in time of combat. Here the unnecessary supplies and personnel block the flow of the necessary resources. Thus it directly damages combat effectiveness [emphasis in original].[15]

When combat or logistic resources are not allocated appropriately, additional resources must be expended to reallocate the necessary resources to the combat forces in need. Expediting material consumes time and distribution assets in searching for and moving a handful of critical supplies. An intra-theater transportation system that is expending resources to overcome the Logistic Snowball is reacting to a problem and can not respond as well to the operational needs of the combatant commander.

Synchronization: The operational logistician must be sensitive to synchronization and its associated demands for responsive logistic support. Synchronization suggests the existence of a decisive time and place where combat forces will produce maximum relative combat power against the enemy forces.[16] Synchronization, unfortunately, poses a dilemma for the logistician. Achieving its maximum relative combat power in a synchronized maneuver, a combat force will simultaneously generate its greatest logistical demands for sustainment. At the

peak of battle resource availability will be at a premium. The resources needed to schedule, arrange, transport and distribute the supplies may not be readily available or may be impeded by the proximity of combat. Therefore, synchronization leads to the danger where combat forces reach their culmination point before the logistic system can resupply them. A logistic system that can not resupply the combat forces before their culminating point is not fulfilling its duties to be responsive.

Gen. Walter Bedell Smith described the difficulty of coordinating logistics with the movement of combat forces. This difficulty does not diminish the need for responsive logistics support. A disaster may needlessly occur if combat forces do not receive the right support at the right place at the right time. This necessity makes "responsiveness" the most important of all seven Principles of Logistics[17] and the centerpiece of the first Logistic Plan Review Criterion.

Criterion #2. Does the logistic plan sustain all elements of the military force?

> "Logistics is the creation and sustained support of combat forces and weapons. Its objective is maximum sustained combat effectiveness."
>
> - RADM Henry E. Eccles, USN, 1959[18]

After "responsiveness", "sustainability" is the second most important Principle of Logistics at the operational level of war. "Sustainability" and "sustainment" are recurring themes throughout Joint Doctrine. "Sustainment" is the pivotal word in

the definition of "operational logistics",[19] and sustainment planning is one of the five pillars that form Joint Operation Planning.[20]

In addition, "sustainability" is one of the few Principles of Logistics that can be measured. In the Logistic Annex of the OPLAN the logistician provides a "Logistic Sustainability Analysis" (LSA) that quantifies "sustainability" in such terms as "availability" or "days of support." The logistician substantiates his analysis with graphs formatted n accordance with Joint Publication 5-03.2.[21] While the LSA provides a quantitative foundation to measure sustainability, other issues, however, can affect the answer to this criterion.

Should "All" Combat Forces Be Sustained? The wording of this particular Logistic Plan Review Criterion deserves further explanation. It is a logistic challenge to sustain "all" forces at their full combat strength. Trade-offs exist in the distribution of resources and the sustainment of combat forces. For example, one item or commodity in critical supply may disable a unit. Operational considerations may compel the combatant commander to redistribute resources from combat units in a low threat region in order to sustain combat forces positioned in a high threat area. Until they are resupplied, the combat units in the low threat region will not be sustained at full combat strength.

Ultimately, the logistician must categorize all combat forces assigned to the combatant commander and determine the

sustainability needs of each element. The following methodology is proposed to cut and chop the total combat force structure into different categories for analysis:

a) units in a low threat area and units in high threat areas,
b) active and reserve units,
c) conventional and unconventional forces,
d) offensive and defensive forces,
e) combat, combat service and combat service support units,
f) air, land and sea forces,
g) units close to and units faraway from the base of operations,[22]
h) units first introduced into the theater of operations and newly arrived units, and
i) units that routinely deploy in exercises and units that deploy only in real world contingencies.[23]

This cut-and-chop technique allows the logistician to reassess the sustainment needs of the total force with regard to different time, distance and force-affiliation factors.

Sustainment: Forcible Entry in an Immature Theater. The logistician will encounter the greatest difficulties sustaining troops that conduct a forcible entry into an immature theater. The following discussion provides a sampling of operational considerations for this scenario.

A forcible entry operation is inherently complicated and risky. Initially, light forces are inserted with a limited amount of supplies. Success frequently depends on the prompt arrival of follow-on forces properly balanced between combat and support forces. If OPSEC is a vital concern, the combatant commander may delay logistic preparations in order to conceal operational intentions.

The sustainment requirements are also immense for an operation in an immature theater. Logistic intelligence is required to determine the extent of in-country resources. The absence of host nation support will compel the logistician to develop an infrastructure to support the combat forces. The logistician must be flexible and balance a myriad of issues, including survivability of the logistic system, the needs of expanding forces, and the avoidance of bottlenecks.[24] Viewing the logistic system as a critical vulnerability, the enemy may attack the logistic system and its sustainment capabilities.[25] In order to ensure the survivability of the logistic system, operations and logistics must be closely coordinated.

Forcible entry and an immature theater, together, comprise the most difficult scenario to support and will tax the imagination and resourcefulness of the logistician at the operational level. Logistics in this scenario may even dictate the options available to the combatant commander:

> [L]ogistics was greatly responsible for the preference of American military chiefs for a cross-Channel attack for the main effort as opposed to a Mediterranean or other approach on the Continent....[L]ogistics dominated the definition of objectives, the choice of landing sites, the size of the assault force, and plans for building up the initial forces and pushing inland.[26]

Sustainment of the Allied forces ashore was critical because:

> [t]he men who planned Operation Overlord were well aware that the success of an eventual Allied invasion of Europe would depend above all on their ability to feed-in troops and equipment at a higher rate than the enemy.[27]

Regardless of the theater (mature or immature), the type of operation (forcible or peaceful entry) or the type of warfare (attrition or maneuver warfare), sustainability and sustainment are the crux to successful military operations and to the second Logistic Plan Review Criterion.

Criterion #3. Where are the Logistic Culminating Points?

"What I want to avoid is that my supplies should command me."

- Comte de Guibert, 1770[28]

Logistics determine the operational reach of the combat forces, the distance over which military power can be concentrated and employed decisively.[29] Logistics can extend operational reach by forward logistics, basing, transportation, the effectiveness of the lines of communication and the throughput of supplies.[30] Logistics also dictate the characteristics of operational reach, including the size of the combat force, the depth of the attack or the speed of advance. With operational reach combat forces can maneuver to gain positional advantage relative to the enemy's center of gravity. "The ability to maneuver must be a trait not only of combat forces but also of the logistic resources that support them."[31]

Operational reach has its logistic limits, a finite range beyond which the logistic system can not support the combat force or their desire to maintain effective operations. At that point in space and time when the offensive becomes overextended logistically, the combat forces have reached their Logistic

Culminating Point. Past the Logistic Culminating Point offensive combat power no longer sufficiently exceeds that of the defender to continue the offense, and logistics inhibits the combatant commander's freedom of action.

Joint Doctrine provides the operational logistician with the prescription to deter the arrival of the culminating point:

> Synchronization of logistics with combat operations can forestall culmination....At both tactical and operational levels, theater logistic planners forecast the drain on resources associated with conducting operations over extended distance and time. They respond by generating enough military resources at the right times and places to enable their commanders to achieve strategic objectives before reaching their culminating point. If the commanders cannot do so, they should rethink their concept of operations.[32]

More than one Logistic Culminating Point may exist. The supply of ammunition, fuel or a particular commodity may create its own Logistic Culminating Point. The logistician must be able to identify the Logistic Culminating Points to the combatant commander. Otherwise, past the Logistic Culminating Point, as Comte de Guibert warns, logistics start to command the commander.

Criterion #4. What is the risk of executing this logistic plan?

> "A real knowledge of supply and movement factors must be the basis of every leader's plan; only then can he know how and when to take risks with those factors, and battles are won only by taking risks."
>
> - Sir A.C.P. Wavell, 1946[33]

Risk at the operational level exposes one's forces to harm and potential destruction. The combatant commander must weigh the risk associated with any movement or positioning of forces

against expected benefits. He may elect to reduce that risk or decide that the expected benefits justify the risk.

The Logistic Culminating Points are the ultimate risk, and are accorded their own Logistic Plan Review Criterion. However, the logistic system will have other risks that can affect the operational level of war. The tempo of operations may generate risks associated with a force expanding faster than what the logistic system can support, bottlenecks in distribution of supplies or the loss of visibility of assets in theater. Moreover, the logistic system is vulnerable to direct and indirect attacks on friendly lines of communication, operational fires directed at friendly logistic infrastructure, political decisions that affect access to host nation support, loss of logistic command and control systems and information warfare.

The answer to this criterion should identify these risks for the combatant commander. Ultimately, the combatant commander must assess these risks and make his decision. His assessment becomes a part of his plan. As Sir Wavell points out, the combatant commander has the responsibility to know how and when to take the risks that will win the battle.

Criterion #5. Are there sufficient resources to react to an unplanned contingency?

> "He who is not the master of logistics becomes its slave."
>
> - RADM Henry E. Eccles, USN, 1978

The logistician can never have sufficient resources to respond to every conceivable contingency. However, with a careful analysis of possible outcomes within the theater, the logistician can anticipate the requirements that will be generated and determine which requirements can and can not be satisfied. This analysis may persuade the combatant commander to take an alternative, less-risky course of action. The logistician who can favorably affect operational decisions has maintained mastery over logistics. Equally important, the logistician has avoided a course of action that would have created a logistic bottleneck and that would have enslaved the logistician, the combatant commander and, ultimately, the combat forces to logistics.

For example, the combatant commander intends to execute OPLAN "A" to initiate battle. OPLAN A has a highly desired strategic end state but may generate substantial combat casualties. The logistician anticipates that combat casualties under OPLAN A would inundate in-theater medical units and that the additional assets required to be flown into theater would overwhelm the transportation and distribution system. The logistic bottleneck will develop into a formidable problem. The entire airlift system, from the strategic to tactical theaters,

would have to adapt to the new priority of supplying medical resources. Other air-worthy material would compete for flights with these medical resources. Airlift assets would have to be rescheduled, unloaded, loaded with the critical medical supplies, flown in-theater and compete with other airlift missions for material-handling equipment, cargo-handling personnel, warehousing and distribution. The amount of logistic assets expediting the establishment of a more expansive medical infrastructure is less assets devoted to sustaining the combat forces. In addition, the lead time for other critical non-medical supplies would increase.

The logistician must communicate to the combatant commander the sufficiency of in-theater resources to react to an unplanned contingency, the risk of creating a logistic bottleneck and the adverse effects to the sustainment of combat forces.

CONCLUSION

Armed with these Logistic Plan Review Criteria, the combatant commander can quickly identify the critical operational logistic issues and determine if the logistic plan supports the operation plan. A sound operation plan must have adequate logistic support. As Admiral Spruance admonished, if the combat forces do not receive the necessary minimum of logistic support, the operation may fail, or at best be only partially successful.

IMPLICATIONS FOR THE OPERATIONAL LOGISTICIAN

The Logistic Plan Review Criteria provide an agenda for the combatant commander and the logistician to discuss the merits and hazards of the logistic plan. These criteria define the limits of the logistic system to support an operation, beyond which the combatant commander incurs unacceptable risks. These criteria are not designed to arm the combatant commander with an unfair advantage or to make the logistician the arbiter between the feasible and the infeasible. Nor is the logistician expected to respond positively and affirmatively to these criteria or to boast of logistic capabilities that the system can not deliver.

On the other hand, the logistician must be prepared to discuss these criteria effectively and demonstrate those qualities that will allow him to define the limits of the logistic system. The logistician must communicate with conviction the ability of the logistic system to respond and to sustain the combat forces. Fortitude is needed to identify the Logistic Culminating Points and those logistic risks associated with any military combat option. The logistician must be candid in order to explain the ability or inability of the logistic system to react to unplanned contingencies. Using these criteria to identify limits and risks to the combatant commander, the logistician's greatest contribution will be to bridge the operations-logistic gap.

Appendix A

Principles of Logistics

Attainability. Attainability (or adequacy) is the ability to provide the minimum essential supplies and services required to begin combat operations.

Economy. Economy is the provision of support at the least cost.

Flexibility. Flexibility is the ability to adapt logistic structures and procedures to changing situations, missions and concepts of operations.

Responsiveness. Responsiveness is the right support at the right place at the right time.

Simplicity. Simplicity is avoidance of complexity and often fosters efficiency in both the planning and execution of national and theater logistic operations.

Survivability. Survivability is the capacity of the organization to prevail in the face of potential destruction.

Sustainability. The ability to maintain the necessary level and duration of operational activity to achieve military objectives. Sustainability is a function of providing for and maintaining those levels of ready forces, materiel, and consumables necessary to support military effort.

Appendix B

Glossary

Combatant Commander. A commander in chief of one of the unified or specified combatant commands established by the President. Also called CINC.

Concept of Logistic Support. A verbal or graphic statement, in a broad outline, of how a commander intends to support and integrate with a concept of operations in an operation or campaign.

Concept of Operations. A verbal or graphic statement, in broad outline, of a commander's assumptions or intent in regard to an operation or series of operations. The concept of operations frequently is embodied in campaign plans and operation plans; in the latter case, particularly when the plans cover a series of connected operations to be carried out simultaneously or in succession. The concept is designed to give an overall picture of the operation. It is included primarily for additional clarity of purpose. Also called commander's concept.

Lines of Communication. All the routes, land, water, and air, which connect an operating military force with a base of operations and along which supplies and military forces move.

Logistic Assessment. An evaluation of: a) the logistic support required to support particular military operations in a theater of operations, country, or area. b) The actual and/or potential logistic support available for the conduct of military operations either within the theater, country, or area, or located elsewhere.

Logistic Estimate of the Situation. An appraisal resulting from an orderly examination of the logistic factors influencing contemplated courses of action to provide conclusions concerning the degree and manner of that influence.

Logistics. The science of planning and carrying out the movement and maintenance of forces. In its most comprehensive sense, those aspects of military operations which deal with: a) design and development, acquisition, storage, movement, distribution, maintenance, evacuation and disposition of material; b) movement, evacuation and hospitalization of personnel; c) acquisition or construction, maintenance, operation, and disposition of facilities; and d) acquisition or furnishing of services.

Operational Art. The employment of military forces to attain strategic and/or operational objectives through the design, organization, integration, and conduct of strategies, campaigns, major operations, and battles. Operational art translates the joint force commander's strategy into operational design, and ultimately, tactical action, by integrating the key activities of all levels of war.

Operational Level of War. The level of war at which campaigns and major operations are planned, conducted, and sustained to accomplish strategic objectives within theaters or areas of operations. Activities at this level link tactics and strategy by establishing operational objectives needed to accomplish the strategic objectives, sequencing events to achieve the operational objectives, initiating actions, and applying resources to bring about and sustain these events. These activities imply a broader dimension of time or space than do tactics; they ensure the logistic and administrative support of tactical forces, and provide the means by which tactical successes are exploited to achieve strategic objectives.

Operational Reach. The distance over which military power can be concentrated and employed decisively.

Shortfall. The lack of forces, equipment, personnel, materiel, or capability, reflected as the difference between the resources identified as a plan requirement and those apportioned to a combatant commander for planning, that would adversely affect the command's ability to accomplish its mission.

Sustainment. The provision of personnel, logistic and other support required to maintain and prolong operations or combat until successful accomplishment or revision of the mission or of the national objective.

Synchronization: The arrangement of actions by one's own and friendly forces in time, space and purpose to produce maximum relative combat power at a decisive place and time.

Endnotes

1. U.S. Navy Department. Naval Doctrine Publication 4: Naval Logistics. (Washington: 10 January, 1995), p. 33.

2. Joint Chiefs of Staff, Joint Pub 4-0 Doctrine For Logistic Support of Joint Operations. (Washington: 27 January, 1995), p. II-1.

3. A "combatant commander" is a commander in chief of one of the unified or specified combatant commands established by the President. Also called CINC. Ref: Joint Chiefs of Staff, Joint Pub 5-0 Doctrine for Planning Joint Operations (Washington: 13 April, 1995), p. GL-4.

However, since these Logistic Plan Review Criteria are universal, the term "combatant commander" in this paper can be expanded to include any unified commander, specified commander, JTF Commander, component commander or any person in a command position with a supporting logistics organization.

4. "Among many considerations, operational art requires commanders to answer the following questions:

> What military (or related political and social) conditions must be produced in the operational area to achieve the strategic goal? (Ends)
>
> What sequence of actions is most likely to produce that condition? (Ways)
>
> How should the resources of the joint force be applied to accomplish that sequence of actions? (Means)
>
> What is the likely cost or risk to the joint force in performing that sequence of actions?

Ref: Joint Chiefs of Staff, Joint Pub 3-0 Doctrine for Joint Operations (Washington: 01 February, 1995) p. II-3.

5. The four Operation Plan Review Criterion are adequacy, feasibility, acceptability, and compliance with joint doctrine. Ref: Joint Chiefs of Staff. Joint Pub 5-0. Doctrine for Planning Joint Operations (Washington: 13 April, 1995) pp. I-13 through I-14.

6. This paper uses the term "logistic plans" to include any one of the logistic schemes developed either during Deliberate Planning or Crisis Action Planning. The term includes the Concept of Logistic

Support, the Logistic Estimate, the Logistic Analysis of Courses of Action, or the Logistic Assessment.

7. Joint Chiefs of Staff, Joint Pub 4-0 Doctrine For Logistic Support of Joint Operations (Washington: 27 January, 1995), p. IV-1.

8. Joint Chiefs of Staff, Joint Pub 1 Joint Warfare of the Armed Forces of the United States (Washington: 10 January, 1995), p. IV-2.

9. RADM Henry E. Eccles, Logistics in the National Defense, (Harrisburg, PA: The Stackpole Company, 1959), p. 18.

10. RADM Henry E. Eccles, Logistic Research Notes (Washington, D.C.: George Washington University Logistics Research Project, 1961) p. 3.

11. There are several sources of logistic checklists. See Appendix D "Logistic Checklist for OPLANS Annex D" in Joint Publication 4-0 Doctrine for Logistic Support of Joint Operations, and Appendix E "J-4, Logistics" in Joint Publication 5-00.2 Joint Task Force Planning Guidance and Procedures.

12. General Walter Bedell Smith, Eisenhower's Six Great Decisions, (New York: Longmans, Green and Co., 1956), p. 82.

13. Appendix A provides the definitions of all logistics principles. Ref: Joint Chiefs of Staff, Joint Pub 4-0 Doctrine For Logistic Support of Joint Operations. (Washington: 27 January, 1995) p. II-1.

14. The lack of logistics discipline may be inferred from lessons learned during Operations Desert Shield/Desert Storm. One post-war study showed a wide disparity in the application of Uniform Military Movement and Issue Priority System (UMMIPS) priorities to requisitions with the Desert Storm/Desert Shield project codes that were submitted to the supply system from the period of 29 December 1990 through 23 January 1991:

	Issue Priority I Requisitions	Total Requisitions	Percentage of Issue Group I
Navy	36,480	126,348	29%
USMC	15,825	33,271	48%
Army	189,429	336,780	56%
USAF	79,921	87,918	91%

Ref: U.S. Navy. Operations Desert Shield/Desert Storm: Logistics Lessons Learned. Naval Supply Systems Command, Department of the Navy (Washington: 30 April, 1992) p. II-8.

If these figures truly indicate a lack of logistics discipline, one may also presume that high priority material was competing on the same status with low priority material for space on airlift assets. This ultimately gives momentum to the Logistics Snowball.

15. RADM Henry F. Eccles, USN, Military Concepts and Philosophy (New Brunswick, NJ: Rutgers University Press, 1965), pp. 83-85.

16. Joint Chiefs of Staff, Joint Pub 1-02 DoD Dictionary of Military and Associated Terms (Washington: 23 March, 1994), p. 371.

17. Joint Chiefs of Staff, Joint Pub 4-0 Doctrine For Logistic Support of Joint Operations (Washington: 27 January, 1995), p. IV-1.

18. RADM Henry E. Eccles, Logistics in the National Defense. (Harrisburg, PA: The Stackpole Company, 1959), p. 22.

19. Operational logistics "encompasses those support activities required to sustain campaigns and major operations" (emphasis added). Ref: U.S. Army, Field Manual 100-5 Operations, Department of the Army (Washington: 14 June, 1993), p. 12-3.

20. The five pillars of Joint Operation Planning include mobilization, deployment, employment, sustainment and redeployment planning. Joint Chiefs of Staff. Joint Pub 5-0. Doctrine for Planning Joint Operations (Washington: 13 April, 1995) p. I-3.

21. Joint Chiefs of Staff, Joint Pub 5-03.2 Joint Operation Planning and Execution System, Vol. II (Washington: 04 August, 1993), pp. III-293 through III-296.

22. Joint operations create their own unique problems in logistics. The component commanders are responsible for providing logistics support to their units. Yet, for example, there may be units from one service who are considerable closer to the logistic units from a sister service than they are to the logistics units from their parent service. This may lead to a disparity in the logistics support among units from different services in the same geographical area. The logistician must be aware of these situations and recommend to the supported commander that, in these

special circumstances, the component commanders provide the logistics support for nearby units from sister services.

23. As a classic example, the Navy Fleet Hospital experienced numerous problems with logistics support during Desert Shield/Desert Storm. "When Fleet Hospital #5 was activated and the Air Detachment arrived in-country, there was no identified supply of process water (for vehicle radiators, cooking, washing, sanitation), POL (especially motor fuel and engine oil) or refrigerants for the first several days the hospital was being assembled. Ref: U.S. Navy. Operations Desert Shield/Desert Storm: Logistics Lessons Learned. Naval Supply Systems Command, Department of the Navy, (Washington: 30 April, 1992) p. I-13.

Other major issues for the Fleet Hospital included modification of the field assembly plan, command and control, pre-mobilization planning, food service, supply manning and manning for non-medical functions, custody of fleet hospital assets during redeployment, and loadout of fleet hospitals.

24. Joint Chiefs of Staff, Joint Doctrine Capstone and Keystone Primer (Washington: 25 May, 1995), p. 60.

25. The British experience in the Falklands shows how sustainment became a critical issue when the Argentinean air force attacked the British supply ships, sinking the Atlantic Conveyor and Sir Galahad and causing the medical support ship Canberra to retreat to a safe haven. Atlantic Conveyor carried several Chinook helicopters and winter tents. The loss of the helicopters severely hampered intra-theater movement of troops and supplies. Kenneth L. Privratsky, "British Combat Service Support During the Falklands War: Considerations for Providing Operational Sustainment to Remote Areas." U.S. Army Command and General Staff College, School of Advanced Military Studies (Ft Leavenworth, KS: 01 April, 1986) pp. 20-24. And Stephen P. Peterson, "Operational Sustainment: The Impact of Critical Decisions Upon Operational Design." U.S. Army Command and General Staff College, School of Advanced Military Studies, (Ft Leavenworth, KS: 15 May, 1989) p. 24.

26. James A. Huston, The Sinews of War: Army Logistics 1775-1953 (Washington, D.C.: U.S. Government Printing Office, 1966), p. 523.

27. Martin Van Creveld, Supplying War: Logistics From Wallenstein to Patton. (Cambridge: Cambridge University Press, 1977) p. 206.

28. Robert Debs Heinl, Jr, Dictionary of Military and Naval Quotations, (Annapolis: United States Naval Institute, 1966), p. 315.

29. Joint Chiefs of Staff, Joint Pub 3-0 Doctrine for Joint Operations (Washington: 01 February, 1995), p. III-16.

30. Ibid.

31. Ibid., p. IV-9.

32. Ibid., p. III-22.

33. Quoted in Martin Van Creveld, Supplying War: Logistics From Wallenstein to Patton (Cambridge: Cambridge University Press, 1977) p. 232.

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